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RE: NZTA – Beaumont Bridge Contaminated Land Technical Review

1 Introduction

The New Zealand Transport Agency (NZTA) has applied for a suite of consents to authorise the construction of a new bridge over the Clutha / Mata-au at Beaumont.

As part of the application, land use consents are being sought from the Otago Regional Council for disturbance of a contaminated site under the Regional Plan: Waste and from the Clutha District Council for disturbance of land under the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NES).

Under the Regional Plan: Waste, the disturbance of land at a contaminated site is discretionary and as such the applicant has submitted an Assessment of Environmental Effects (AEE) prepared by WSP-Opus 'New Beaumont Bridge – Notice of Requirement for an Alteration to a Designation and Resource Consent Applications' dated October 2019. Pertinent supporting documents include:

- A Preliminary Site Investigation by WSP-Opus dated March 2019.

e3Scientific Limited (e3s) have been commissioned by Otago Regional Council to provide a technical review of the contaminated land related aspects of the consent application.

1.1 Scope of Work

The scope of this technical assessment includes:

- Reviewing the adequacy of the WSP-Opus Preliminary Site Investigation.
- Assessing the effects associated with disturbance of soil at the site.
- Suggesting additional information requirements to address any information gaps.

The scope of this technical assessment does not include:

- An assessment of the effects associated with other aspects of the application not related to contaminated land.
- An assessment of the activity's status under the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (2011) (NESCS).

This assessment is focussed on the information provided in the AEE by WSP-Opus (2019).

2 Proposal

The NZTA are proposing to construct a new bridge over the Clutha / Mata-au at Beaumont, State Highway 8.

Excavation of land is required for the construction of the eastern and western approaches, and local road improvements. These activities will require topsoil stripping, bulk fill for the embankments and excavation.

The earthworks required falls into the following four broad categories:

- Stripping of topsoil and unsuitable surface material
- Excavation and removal of any unsuitable material
- Construction of road embankments
- Ground improvements required for the construction of road embankments

Approximately 50,000 m³ of cut and fill is required – made up of approximately 15,000 m³ of cut and 35,000 m³ of fill. Surplus excavated material is to be deposited on the eastern bank in a new landscaped rest area adjacent to the cycle trail.

According to the applicant, the earthworks will also include some excavation of contaminated land. However, based on the recommendations included in the Preliminary Site Investigation (PSI) no controls are proposed to mitigate potential effects of contaminants in soil.

3 Preliminary Site Investigation

3.1 Preliminary Site Investigation – Summary

The stated purpose of the PSI is 'to provide information as to whether soil contamination from potential Hazardous Activities and Industries List (HAIL) activities are likely to be present and if so whether they are at levels that could adversely impact human health.' The listed objectives of the PSI included:

- Assess the current site condition and its surrounding environment;
- Determine whether HAIL activities have occurred;
- Assess the risks to human health associated with these activities; and
- Characterisation of the site in line with NES guidance giving recommendations of remedial options should they be required.

The investigation area was identified as comprising of three parcels of land – Section 4 Survey Office Plan 23609, Section 2 Survey Office Plan 23610, and Section 4 SO 23610.

Based on a site walkover, and review of site history the following HAIL activities were identified in the report:

- A sheep dip on the eastern bank (HAIL category A8)
- An orchard north of the State Highway on the western bank (HAIL category A10)
- A car parking area on the west bank (HAIL category I)
- A railway line close to the eastern boundary (HAIL category I)
- Historic settlements on the west bank (HAIL category I)
- Gold mining in the vicinity (HAIL category I).

The primary human health receptors were determined to be site workers, residents and visitors following the construction of the new bridge. A commercial/ Industrial

outdoor worker (unpaved) end use was then used as part of the conceptual site model to assess risks to site workers during construction, and to future users of the site.

Specific comment was provided regarding the risks associated with each of the perceived HAIL activities in Table 8, and are summarised below:

- The risks associated with the sheep dip was considered low because it is located in an area of the site that will not be disturbed by the proposed development.
- The risk associated with the orchard was considered low as the orchard was located outside of the site.
- The risk associated with the car parking area was considered low due to the low intensity use and absence of visible signs of contamination.
- The risk associated with the historic railway was considered low as, for the most part, it will not be disturbed.
- The risk associated with the historic settlement was considered low as the area to be disturbed is relatively small.
- The risk associated with gold mining was considered low, as gold mining was not known to have occurred directly on the site.

Overall, the Preliminary Site Investigation concluded that it is more likely than not that the risk to human health associated with the development identified on the site is low, and it was considered highly unlikely that there will be a risk to human health associated with the proposed development.

The PSI concluded that the proposed land use change and soil disturbance associated with the construction of the new Beaumont Bridge should be permitted activities under the NES due to the low risk to human health. [NB: This differs from the AEE, which correctly acknowledges that the application under the NES is fully discretionary due to the absence of a Detailed Site Investigation]. Requirements under the Regional Plan: Waste were not assessed.

No specific controls or monitoring are recommended, other than to consult a contaminated land practitioner should any ground conditions be encountered across the site which are not anticipated from the findings of the report.

3.2 Preliminary Site Investigation – Peer Review Comments

Overall, the contents of the report and the general methodology of investigation are generally consistent with the Ministry for the Environment's Contaminated Land Management Guideline No 1: Reporting on Contaminated Sites in New Zealand (2003a). The site history review is reasonably thorough. However, there are several discrepancies within the conceptual site model that undermine the assessment of risk and conclusions within the report.

The site, as identified in section 2.1 of the PSI, is comprised of three parcels; however, the Overall Site Layout Plan (RP 5615-6200) included with the application shows that soil disturbance is required over a much greater area. It is not clear whether the scope of the PSI matches the scope of soil disturbance required by the proposal.

There are also several inconsistencies between the nature and location of the works as described in the PSI and as detailed in other consent application documents. These discrepancies are critical to the assessment of risk conducted in the PSI, which often relied on HAIL activities occurring outside of the area of soil disturbance.

Risk associated with the orchard: Contrary to the statements in the PSI, the overall Site Layout Plan (RP 5615-6200) and construction cross sections show that topsoil stripping would be required within the footprint of the former orchard along the edge of SH8 (See Figure 1).



Figure 1: 1963 aerial image showing orchard overlaid with Overall Site Layout Plan. Image sourced from retrolens.nz and licensed for reuse under LINZ CC BY 4.0.



Risk associated with the sheep dip: Based on the Overall Site Layout Plan (RP 5615-6200) and the approximate location of the sheep dip as shown in appendix D of the PSI, the sheep dip is located approximately 10 m from the area of soil disturbance (See Figure 2). The distribution of contaminants at sheep dip sites is variable and dependant on the site-specific layout of the yard; however, contamination extending more than 10 m from the dip site is not uncommon (for example, yards where freshly dipped sheep may have been penned).



Figure 2: Approximate location of sheep dip as identified in PSI overlaid with the Overall Site Layout Plan.

Risk associated with the railway line: Contrary to statements in the PSI, the Overall Site Layout Plan (RP 5615-6200) shows that the realigned State Highway passes directly through the former Beaumont Railway Station and sidings (See Figure 3). This activity fits within HAIL category F6: Railway yards including goods-handling yards, workshops, refuelling facilities or maintenance areas. Potential contaminants associated with this category include: hydrocarbons, solvents, creosote/phenols, and metals.

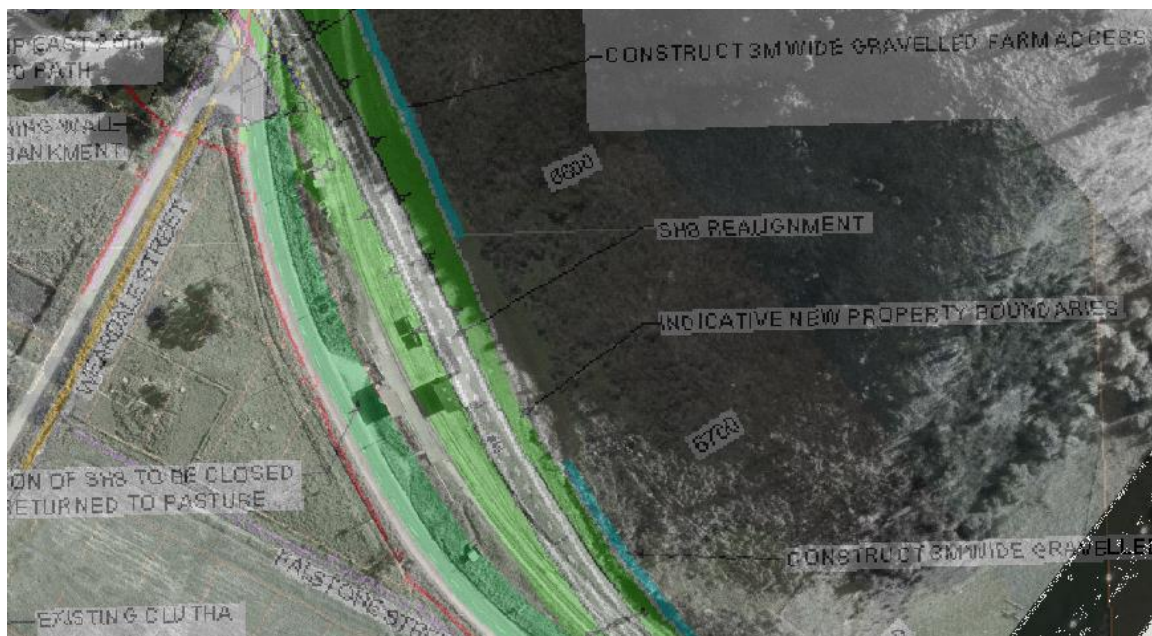


Figure 3: 1963 aerial image showing railway yard overlaid with Overall Site Layout Plan. Image sourced from retrolens.nz and licensed for reuse under LINZ CC BY 4.0.

Risk associated with historical settlement: The PSI identifies the historical settlement on the western bank of the river as a potential HAIL activity. The PSI is not specific about where exactly historical settlement may have occurred, or what contaminating activities may have occurred. The archaeological report prepared by WSP-Opus in October 2019 (six months after the PSI was completed) does describe the pre-1900 history of the area in detail, and notes that an 1870's house was located to the southwest of the Beaumont Bridge. A blacksmiths was also located north of what is now SH8. A twentieth century house or other structure is also visible on the eastern bank in historic aerial photographs in the PSI (see Figure 4). There is no comment on this structure in the report, or whether it may be associated with a potentially contaminating activity (for example, from lead based paint or deteriorated asbestos).



Figure 4: 1947 aerial image showing structure on the eastern bank. Image sourced from retrolens.nz and licensed for reuse under LINZ CC BY 4.0.

Although the PSI states that the future site users will include visitors, residents and workers, the PSI adopts a commercial industrial outdoor worker exposure scenario as part of the conceptual site model. Further justification is needed to support this choice, particularly for the landscaped rest area where excess soils are proposed to be taken. A recreation-type exposure which would include children as a critical receptor may be more appropriate here.

In addition to human health, potential impacts to surface water during soil disturbance is also relevant, as is any requirements for off-site soil disposal. These are both present within the conceptual site model diagram in Figure 6 of the PSI, but not discussed in any detail.

4 Applicability of the Regional Plan: Waste

Although the soils at the site have not been investigated, the planning assessment in the resource consent application implies that the site is a contaminated site.

For a piece of land to be considered a contaminated site, concentrations of contaminants on site should exceed background levels, *and* assessments indicate it may pose an immediate or long-term hazard to human health or the environment. In practice, the criteria for determining whether a site is 'contaminated' vary from site to site. The criteria for a given site are established using a source-pathway-receptor conceptual site model that considers:

- The hazardous substances found;
- The media (soil, air, water) in which the substances occur;
- The naturally occurring background concentrations in the area;
- The pathways of potential human health or ecological exposure;
- The current or proposed use of the site;
- The nature of sensitive receptors that may be exposed to contaminants at or near the site.

Typically, concentrations of contaminants on site are compared with generic Soil Guideline Values (SGVs) that are relevant to the conceptual site model. Exceedances of SGVs indicate that it is reasonably likely that there are significant adverse effects.

In this case, contaminant concentrations at the site have not been assessed. It may be that consents are sought on a precautionary basis or based on a conservative interpretation of the Regional Plan: Waste.

5 Assessment of Environmental Effects and Management of the Proposed Activity

Due to the limitations of the Preliminary Site Investigation, it is not known whether contaminants are present in soil at concentrations which could pose a hazard to human health or the environment.

In the absence of soil quality data, precautionary controls could be implemented to mitigate potential effects, i.e. managing soil as if it were contaminated in the absence of evidence to the contrary.

In this case, the applicant has proposed to undertake works in accordance with a Construction and Environmental Management Plan (CEMP) to provide the overall environmental management framework and approach. The plan will contain a series of sub-plans to address activity specific matters; however, the applicant has not proposed any specific plan to control the potential effects of contaminants in soil.

As such, it is not possible to assess the effects of disturbing a 'contaminated site' should one be present within the development area.

6 Request for Further Information

In order to facilitate an adequate assessment of environmental effects, additional information is required.

The applicant could be requested to provide:

- An updated site plan showing areas of potential HAIL activity and current soil excavation plans.
- A Detailed Site Investigation, prepared in accordance with Contaminated Land Management Guidelines No 1 and No 5, for potentially contaminated land which will be disturbed during development, and
- A Contaminated Soil Management Plan, or outline of how contaminated soil will be managed to avoid adverse effects on the environment.

Alternatively, it may be appropriate to require a staged approach of further investigations, along with commensurate site management as conditions of consent. In this case, the applicant could be requested to provide:

- An updated site plan showing areas of potential HAIL activity and current soil excavation plans.
- Details of how contaminants in soil will be investigated and managed to avoid adverse effects on the environment.

7 Summary and Conclusions

Overall, it is difficult to evaluate the environmental effects associated with the proposed soil disturbance for new Beaumont Bridge in the absence of soil quality data or a detailed description of how contaminants in soil will be investigated and managed as part of development works.

If you have any questions regarding the information provided in this letter, please contact Simon Beardmore on 03 409 8664 or via email at simon.beardmore@e3scientific.co.nz

Yours sincerely,



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References

Ministry for the Environment. (2003a). *Contaminated Land Management Guidelines No. 1: Reporting on Contaminated Sites in New Zealand (revised 2011)*. Wellington: Ministry for the Environment.